

The number of females attending the second-grade schools is equal to the number of males, and three-fifths of the teachers also in these schools are women. So many important institutions having for their main object the higher education of the sex have been opened in the United States that it is considered that the special examinations of females conducted for some time past under the auspices of the Harvard University may now be dropped. The number of them competing for scholastic honours on the same basis as the men is steadily increasing; "but," the report suggestively adds, "not rapidly enough to threaten any disturbance of existing social, domestic, or business relations."

One association for promoting the higher education of women reports that while the physique of lady students is higher than among women at large, yet that even that of the former is painfully low, and requires that measures should be taken against so dangerous a deterioration.

With regard to the co-education of men with women, a committee, appointed by a Western College to inquire into the subject, conclude by saying:—

"Joint education of men with women in the higher studies has now been tried in a sufficient number and variety of colleges, and for a sufficient length of time to prove that no special difficulties and evils grow out of it, and that it does away with the greatest difficulties and evils of the old monastic system. It makes college life and society more nearly human instead of only 'half-human.' The half-human ever verges first and last towards the bestial, whether in armies, on shipboard, in miners' camps, or in colleges, monasteries, or nunneries. It would be wise to humanise the colleges still more, rather than to begin the process of dehumanising them."

It is then urged that all lectures and studies should be conducted in as public a manner as possible, and attended by friends and relations of both sexes.

Kindergarten teaching is being carried out more largely, but is making its way more as a charitable institution than as a branch of education. Very appropriately it is becoming the ladies' charity; its work is found specially beneficial as the early beginning of a reformatory education for the purpose of overcoming inherited vicious propensities and physical infirmities. Most energetic efforts for this purpose are being made at San Francisco in particular.

Attention is specially called in this report to the desirability of teaching history so as to make the reading of it an intelligent study, attractive to its learners, who will fill up leisure time with its pursuit instead of, as of old, insisting on the laying to heart long tables of dates and dry facts, "killing the life out of the subject, disgusting the pupils, and giving them a dislike for historical reading."

Colleges of the highest class keep increasing in number, yet, nevertheless, the totals of teachers and pupils are small for the proud name each claims of "University." Some have resigned that title and devoted themselves to school work; but more fresh ones have sprung up which constitute a splendid force for future generations when their work, their wealth, and the population supporting them, have been multiplied. The fact of a superabundance of such institutions proves how highly learning even of the least utilitarian character is esteemed.

Perhaps traceably to temporary reasons, classics seem to be gaining rather than losing ground upon physical science at Harvard, a higher standard of instruction and attainment having been required in the latter. Technical schools, however, make steady, though not rapid, progress. Agriculture, mining, and building form so large a proportion of American employment that full attention can be given to these subjects with little hesitation. The bulk of their pupils are at once absorbed in further teaching, instead of putting into practice what they know, with their own hands.

The United States Commissioner of Education takes an annual survey of the whole educational world, and presents it to all who study his report, and when the subjects to be taught a different people like the 200,000,000 of British India are in it placed side by side with those which seem important in our own schools, a question suggests itself whether scientific teachings have not a better claim than the old knowledge to the title of "*literæ humaniores*." We see how local and confined are classical and historical studies, and of what common value to the whole human race are the elements of natural and physical science.

The free education which Texas and others of the United States are in favour of is not recommended by our Commissioners even in a country where it would interfere with so few vested interests as in India.

We are glad to know that a work on public libraries is progressing, which is intended to supplement the special report published in 1876.

There are 11,663 institutions in regular correspondence with the Bureau, and no one reading this report can fail to see the importance of a common centre of communication to so many and so various efforts to carry on the great work that will have such an influence over the next generation. A central nucleus, again, to this organisation must be a library, by reference to which inquiries from so many quarters on so many subjects may be answered. It is hard, therefore, to believe it a wise economy of a great nation to cut down the allowance for so permanent a part of the office as this from 1000 dollars to 500 dollars, which, nevertheless, has been done.

W. ODELL

COLLECTION OF HAIRS AFTER EARTHQUAKES IN CHINA

IN Dr. Macgowan's "Note on Earthquakes in China," republished in *NATURE* for May 6 (p. 17), I find the following passage:—

"The tremors that are experienced in Chehkiang, Kiangsu, and coterminous regions to the west, are sometimes followed by the appearance on the ground of substances that in Chinese books are styled 'white hairs.' When I first called attention to records of that kind that are found in local gazetteers, I suggested that they might be crystals precipitated by gaseous emissions, such as were once reported as occurring after an earthquake in south-west of the United States; from later descriptions of these 'horsetail-like' substances I incline to the opinion that they are organic, perhaps mycelium."

I think there can be little doubt that Dr. Macgowan's conclusion is well founded, and that the "white hairs" have no real connection with the earthquake.

In 1852, during one of the late Mr. Fortune's visits to China, he experienced the shock of an earthquake at Shanghai. He gives the following curious account in "A Residence among the Chinese" (pp. 4, 5), of the subsequent search for the hairs:—

"Groups of Chinese were seen in the gardens, roadsides, and fields engaged in gathering hairs which are said to make their appearance on the surface of the ground after an earthquake takes place. This proceeding attracted a great deal of attention from some of the foreign residents in Shanghai, and the Chinese were closely examined upon the subject. Most of them fully believed that these hairs made their appearance only after an earthquake had occurred, but could give no satisfactory explanation of the phenomenon, while some, more wise than their neighbours, did not hesitate to affirm that they belonged to some huge subterranean animal whose slightest shake was sufficient to move the world."

"I must confess, at the risk of being laughed at, that I was one of those who took an interest in this curious subject, and that I joined several groups who were

searching for these hairs. In the course of my travels I have ever found it unwise to laugh at what I conceived to be the prejudices of a people simply because I could not understand them. In this instance, however, I must confess the results were not worth the trouble I took. The hairs, such as I picked up, and such as were shown me by the Chinese, had certainly been produced above the earth and not below it. In some instances they might readily be traced to horses, dogs, and cats, while in others they were evidently of vegetable origin. The north-eastern part of China produces a very valuable tree known by the name of the hemp-palm [*Chamærops Fortunei*, see Kew Report, 1880, p. 31], from the quantity of fibrous bracts it produces just under its blossoms. Many of these fibres were shown to me by the Chinese as a portion of the hairs in question; and when I pointed out the source from which such had come, and which it was impossible to dispute, my friends laughed, and, with true Chinese politeness, acknowledged I was right, and yet I have no doubt they still held their former opinions concerning the origin of such hairs. The whole matter simply resolves itself into this: if the hairs pointed out to me were the *true* ones, then such things may be gathered not only after earthquakes, but at any other time. But if, after all, these were not the real things, and if some vegetable (I shall not say animal) production was formed, owing to the peculiar condition of the atmosphere and from other causes, I can only say that such production did not come under my observation.¹

W. T. THISELTON DYER

THE U.S. GEOLOGICAL SURVEY

THE American papers contain an announcement which will be received with some astonishment in Europe. A member of Congress, Mr. Herbert, of Alabama, has introduced a Bill into the House prohibiting the Geological Survey of the United States from expending any money for palæontological work, except for the collection, classification, and proper care of fossils and other material; and from composing, compiling, or preparing for publication monographs, bulletins, or other books except an annual report containing merely the transactions of the bureau and other routine official matter. It is further proposed to sell off the laboratories and other property of the Survey which after the passing of the Act would be no longer needed. Of course there may be official or departmental reasons for reorganisation or retrenchment of which the outside world is ignorant. But these reasons must be very serious indeed to justify such action as is proposed. If there is one scientific undertaking of which the United States have pre-eminently just reason to boast as a model to all civilised countries, it is their Geological Survey. For completeness of equipment it has no rival in the world, and already though it has only been seven years in existence its work both for excellence and amount has placed it in the very front of the scientific organisations of the time. Whether we look to its purely scientific achievements or to the importance of its practical work in mining and other economical departments, the crippling of the resources of the Geological Survey of the United States would be a calamity against which not only all lovers of science but all who are interested in the continued development of the natural productions of the great republic would energetically protest. We can hardly suppose that Mr. Herbert will have many supporters, and it is difficult to conceive from what possible motive he is acting. He calculates that if his Bill passes he will effect a saving of 250,000 dollars. He should try to find some branch of the public service where economy and retrench-

¹ "During a recent visit to the North-West Provinces of India, where earthquakes are not unfrequent, I could find no traditions such as that I have alluded to."

ment could be practised without seriously injuring the scientific credit and industrial progress of his country. And no doubt he could succeed in this search.

THE ROYAL SOCIETY SOIRÉE

THE President and Council of the Royal Society are to be entirely congratulated on the success of the reunion at Burlington House on the 12th inst. It was generally felt that the display of objects of interest was finer than any brought together for some years, and the general satisfaction expressed must have amply rewarded those upon whom the burden of the arrangements had fallen.

It is a little hazardous to say which was the most interesting object; but as an *actualité* the unpaired parietal eye of *Sphenodon* exhibited by Mr. Baldwin Spencer, fully described in last week's NATURE, perhaps bore the palm.

Next in biological interest came an exhibit by Mr. W. H. Caldwell including a complete series of the *Ceratodus* from the unsegmented egg to hatching. The complete exhibit illustrated early stages in development of the Monotremata—*Ornithorhynchus* and *Echidna*, the Dipnoid *Ceratodus* and some marsupial genera. The series were as follows:—

(1) Series of early stages of *Ornithorhynchus*, from a few hours after fertilisation to the newly-laid egg, of about the stage of a 36-hour chick; (2) series of early stages of *Echidna*, from just before laying to the newly-hatched foetus; (3) various stages of young *Echidna*, from hatching up to 5 inches long; (4) complete series of *Ceratodus*, from the unsegmented egg to hatching; (5) stages of young *Ceratodus* after hatching; (6) series of about thirty stages, from segmenting egg up to birth of *Phascogaster cinereus*; (7) ditto of *Halmaturus rufus*; (8) Specimens showing the arrangement of the embryonic membranes in *Macropus major*.

There were two exhibits of micro-organisms—one of micro-photographs of Bacteria, and another of certain micro-organisms themselves—by Mr. Cheshire. The former included enlargements, from negatives obtained with an oil immersion $\frac{1}{8}$ inch, of the following:—

Anthrax-bacillus, in tissue-sections and cultivations; hay-bacillus; bacillus of malignant cedema; micrococcus of pneumonia; tubercle-bacillus; bacillus of foul brood; *Bacillus megatherium*; *Clostridium polymyxa*; microbe of chicken cholera; comma-bacilli of Koch, Lewis, and Tinkler; Bacteria of putrefaction.

Mr. Cheshire exhibited (1) *Bacillus alvei* in sporulation; (2) *Bacillus alvei* spores in chain; and (3) spermatozoa of *Apis* forming in flocculent masses for packing in spermatophore.

Preparations illustrating the histological structure of the secretory tissues of certain plants, in which the substances secreted are of economic importance, were exhibited by Mr. W. Gardiner. Among these were hairs of leaf of *Flemingia Grahamiana*—wurras dye; laticiferous vessels of the stem of *Manihot Glaziovii*—ceara rubber; glands of the leaf of *Cinnamomum Camphora*—camphor.

In connection with biological inquiry may be specially mentioned Mr. Frank Crisp's demonstration of a new microscopic object-glass, by Prof. Abbe of Jena, an exhibit rich in hope not only for the future of microscopy, but also for astronomy. Eight of the ten lenses of this objective are made of a new kind of optical glass, composed of phosphates and borates without silic. The glass hitherto used contains as essential components only six chemical elements, while the new objective contains not less than fourteen. The secondary spectrum is by this means entirely removed, and only a small tertiary spectrum remains. The improvement in definition is especially marked